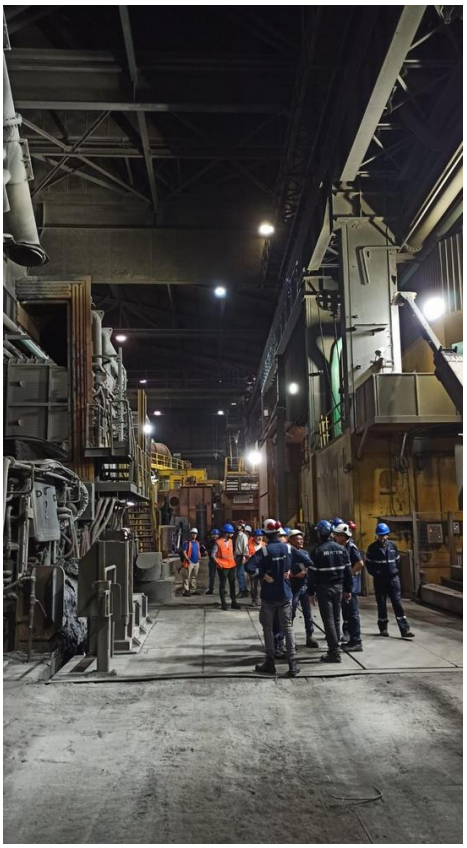
# iSteel-Expert Newsletter No 2

The first year of the project has come to end. It was very intense for the iSteel-Expert consortium starting its exciting adventure towards the development of a **remote expert virtual system** to monitor 24/7 the EAF process.



## One year of work

The first Work Package (WP1) concerns the inventory of the signals that are currently available at Siderpotenza, the installation of the new sensors and the definition of suitable Key Performance Indicators (KPIs) for the system with related calculation procedures. During the first year of the project, new equipment was installed on the plant, i.e. acoustic sensors, accelerometers, optical and thermal cameras, temperature sensors, together with a data acquisition and pre-processing unit. Moreover, KPIs were defined to monitor, assess and validate the performance and benefits of the iSteel-Expert system concerning different aspects, such as electrodes status, slag quality, bucket charge, fumes emission, human and equipment presence, acoustic emissions, vibrations, electric consumption. Finally, training procedures and digital skills of end-users were analysed to create simulation algorithms and models of the melting cycle

Within WP2, both the local and cloud infrastructures of iSteel-Expert were defined, prepared, and configured. The relevant data acquisition, along with the corresponding local preprocessing and data transfer to the cloud were functionally defined, and the implementation job is now in progress. For each output type available from the iSteel-Expert sensor suite (images, acoustic signals concerning environmental noise and cooling water, vibrations signals from Consteel and EAF, off-gas temperature) acquisition

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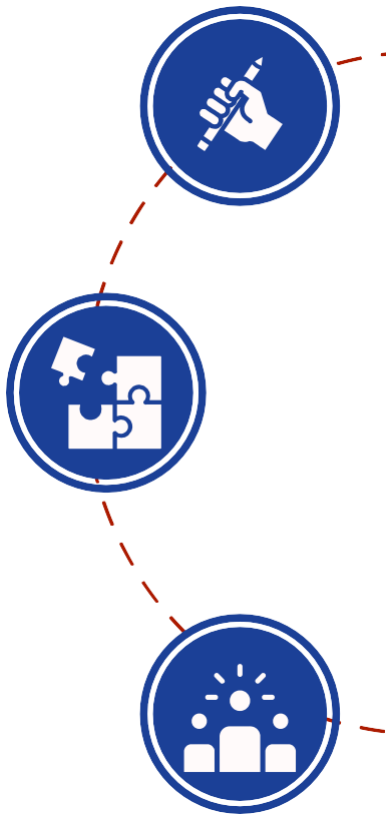
modality, sampling rate, preprocessing goals, and algorithms to extract relevant insights with reference to the KPIs assessing system performance were investigated and defined. Each relevant insight will be identified, extracted and transferred by suitable procedures to the cloud, where data analytics, Machine and Deep Learning tools strengthen and enhance the algorithms for KPIs calculation.

WP3 develops the core of the iSteel-Expert system, namely the computation of functional KPIs and a series of tools for system simulation, key event detection and process control. In this first year, the implementation of the calculation procedures for the KPIs defined in WP1 was started. Furthermore, for the development of the event detection and control tools, a cloud infrastructure was defined for the collection of data from the plant. This data will be used during the development of the various tools for their validation and fine-tuning. The most promising technologies to be included at this juncture were identified and the first tests will begin in the incoming weeks.

WP4 develops innovative training tools. The analysis of media resources describing configuration and/or operation of related systems (e.g., video overview of a control room, photographic material framing individual panels) and the info from SiderPotenza are the basis to develop a virtual mock-up of a control panel.



## Dissemination

iSteel-Expert started raising awareness of the project scope and objectives. To this aim, a **poster** was presented at the **EAF International meeting**, which was held in Bergamo on November 30 – December 1, 2023.

Moreover, a publication was issued on Regione Lombardia Open Innovation Platform.

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